

CLAIM:

1. A drilling vehicle comprising:

- a chassis movable over ground;
- 5 - a tool arm;
- a drilling tool operatively mounted to said tool arm and defining a drilling extremity;
- a tool arm actuator assembly attaching said tool arm to said chassis and comprising:
 - a first tool arm actuator allowing rotational displacement of said tool arm about a vertical axis;
 - a second tool arm actuator allowing linear translation of said tool arm along a first horizontal
 - 10 axis between two limit positions;
 - a third tool arm actuator allowing linear translation of said tool arm along a second horizontal axis which is perpendicular to said first horizontal axis, between two limit positions;
 - a fourth tool arm actuator allowing rotational displacement of said tool arm about a third horizontal axis; and
 - 15 - a fifth tool arm actuator allowing pivotal displacement of said tool arm about a pivotal axis which is perpendicular to said third horizontal axis;
- and
- selectively controlled power means controlling said first, second, third, fourth and fifth tool arm actuators;

20 wherein the position and orientation of said drilling tool drilling extremity is controlled with said first, second, third, fourth and fifth tool arm actuators acting on said tool arm.

2. A drilling vehicle as defined in claim 1, wherein said chassis is modular and comprises at least two chassis portions releasably attached to one another, said tool arm being releasably

25 attached to said tool arm actuator assembly and said tool arm actuator assembly being releasably attached to said chassis.

3. A drilling vehicle as defined in claim 1, wherein said first tool arm actuator allows said tool to rotate from 0° to 180° relative to a reference position.

4. A drilling vehicle as defined in claim 1, wherein said first and third horizontal axes are parallel to each other.

5. A drilling vehicle as defined in claim 1, wherein said fourth tool arm actuator allows said tool arm to rotate from 0° to 360° relative to a reference position.

5 6. A drilling vehicle as defined in claim 1, wherein said fifth tool arm actuator allows said tool arm to pivot of at least one quarter of a turn relative to a reference position.

7. A drilling vehicle as defined in claim 6, wherein said fifth tool arm actuator allows said tool arm to pivot of an angle of 0° to 100° relative to a reference position.

10 8. A drilling vehicle as defined in claim 1, wherein said tool arm actuator assembly further comprises an auxiliary tool arm actuator allowing linear translation of said tool arm along said second horizontal axis between two limit positions, independently of said translation of said tool arm resulting from said third tool arm actuator.

15 9. A drilling vehicle as defined in claim 1, wherein said first, second, third, fourth and fifth tool arm actuators are sequentially attached to one another and wherein said first tool arm actuator comprises a platform shaft mounted to said chassis so as to be rotatable about said vertical axis.

20 10. A drilling vehicle as defined in claim 1, wherein said first, second, third, fourth and fifth tool arm actuators are sequentially attached to one another and wherein said second tool arm actuator comprises a platform integrally attached to said first tool arm actuator and a slider track member having a lower run fixedly attached to said platform and an upper run movably carried by said lower run for allowing translation of said upper run along said first horizontal axis between two limit positions.

25 11. A drilling vehicle as defined in claim 10, wherein said second tool arm actuator comprises another slider track member having a lower run fixedly attached to said platform and an upper run movably carried by said lower run for allowing translation of said upper run parallel to said first horizontal axis between two limit positions, said upper run of said another first slider track member being integrally movable
30 with said upper run of the first-mentioned said first slider track member.

12. A drilling vehicle as defined 1, wherein said first, second, third, fourth and fifth tool

arm actuators are sequentially attached to one another and wherein said third tool arm actuator comprises a slider track member having a lower run fixedly attached to said second tool arm actuator and an upper run movably carried by said lower run for allowing translation of said upper run along said first horizontal axis between two limit positions.

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13. A drilling vehicle as defined in claim 1, wherein said first, second, third, fourth and fifth tool arm actuators are sequentially attached to one another and wherein said fourth tool arm actuator comprises a tool shaft rotatably carried by said third tool arm actuator and rotatable about said third horizontal axis.

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14. A drilling vehicle as defined in claim 1, wherein said first, second, third, fourth and fifth tool arm actuators are sequentially attached to one another and wherein said fifth tool arm actuator comprises a pivotable linkage pivotally mounted to said fourth tool arm actuator and carrying a hydraulic cylinder, said linkage and said cylinder also being attached to said tool arm, allowing pivotal displacement of said tool arm about said pivotal axis.

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15. A drilling vehicle as defined in claim 8, wherein said first, second, third, auxiliary, fourth and fifth tool arm actuators are sequentially attached to one another and wherein said auxiliary tool arm actuator comprises a support block movably mounted to said third tool arm actuator by means of a rack and gear assembly, so as to allow said linear translation of said tool arm along said second horizontal axis between two limit positions, independently of said translation of said tool arm resulting from said third tool arm actuator.

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16. A drilling vehicle as defined in claim 1, further comprising a control console linked to said selectively controlled power means and controlling said first, second, third fourth and fifth tool arm actuator, said control console being carried by a control arm pivotally mounted to said chassis.

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17. A drilling vehicle kit comprising:

- a modular chassis movable over ground;
- a tool arm;
- at least one drilling tool operatively attachable to said tool arm and defining a drilling extremity;
- a first tool arm actuator assembly, with said tool arm being releasably attachable to said chassis

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through the instrumentality of said first tool arm actuator assembly which allows said tool arm to be moved according to a first set of directions when said tool arm is operatively mounted to said chassis by means of said first tool arm actuator assembly;

- a second tool arm actuator assembly, with said tool arm being releasably attachable to said chassis through the instrumentality of said second tool arm actuator assembly which allows said tool arm to be moved according to a second set of directions when said tool arm is operatively mounted to said chassis by means of said second tool arm actuator assembly; and

- selectively controlled power means controlling said first and second tool arm actuator assemblies; wherein a selected one of said first and second tool arm actuator assemblies attaches said tool arm to said chassis, according to a selected set of directions among said first and second sets of directions, and wherein the position and orientation of said at least one drilling tool drilling extremity is controlled according to said selected set of directions.

18. A drilling vehicle comprising:

- a chassis movable over ground;
- a tool arm;
- a drilling tool operatively mounted to said tool arm and defining a drilling extremity;
- a tool arm actuator assembly attaching said tool arm to said chassis and comprising:
 - a first tool arm actuator allowing rotational displacement of said tool arm about a first axis;
 - a second tool arm actuator allowing translational displacement of said tool arm along a second axis between two limit positions;
 - a third tool arm actuator allowing translational displacement of said tool arm along a third axis between two limit positions;
 - a fourth tool arm actuator allowing rotational displacement of said tool arm about a fourth axis; and
 - a fifth tool arm actuator allowing pivotal displacement of said tool arm about a fifth axis;

and

- selectively controlled power means controlling said first, second, third, fourth and fifth tool arm actuators;

wherein the position and orientation of said drilling tool drilling extremity is controlled with said first, second, third, fourth and fifth tool arm actuators acting on said tool arm.

19. A drilling vehicle as defined in claim 18, wherein said second axis is transversal to said first axis and said third axis is transversal to said second axis.

5 20. A drilling vehicle as defined in claim 19, wherein first axis is vertical, said second, third and fourth axes are horizontal, said second axis is perpendicular to said first axis, said third axis is perpendicular to said second axis and said fifth axis is perpendicular to said fourth axis.